1 mole of CCI$_4$ vapours at 27°C occupies a volume of 40 lit. If vander waals constant are 24.6Latm^2 mol^{-2} and 0.125Lmol^{-1}. Calculate compressibility factor under

(a)Low pressure region

(b)high pressure region

Answer:

(a) At low pressure, the compressibility factor is

Z=1−(a/RTV)=1−(24.6/(0.0821×300×40))=0.975

(b) At high pressure, the compressibility factor is

Z=1+(b/V−b)=(1+(0.125/(40−0.125)))=1.003